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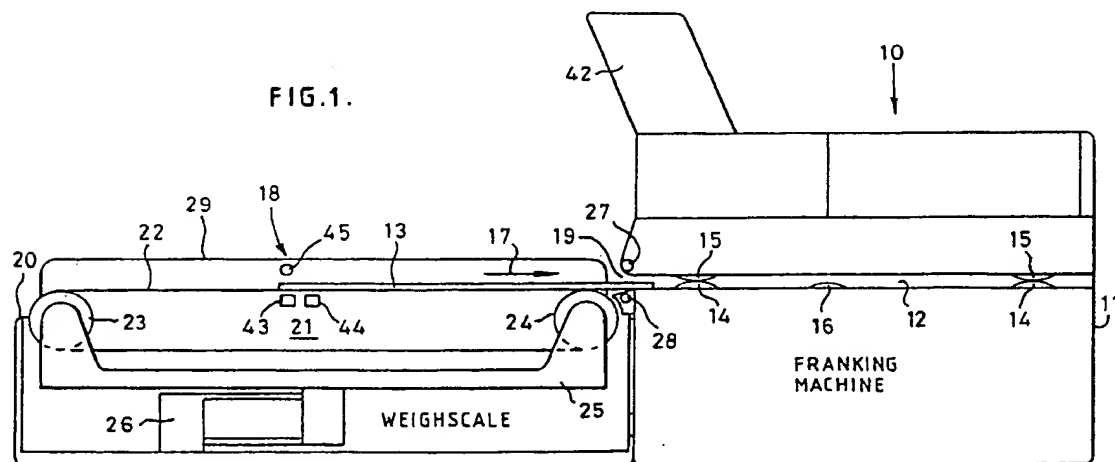
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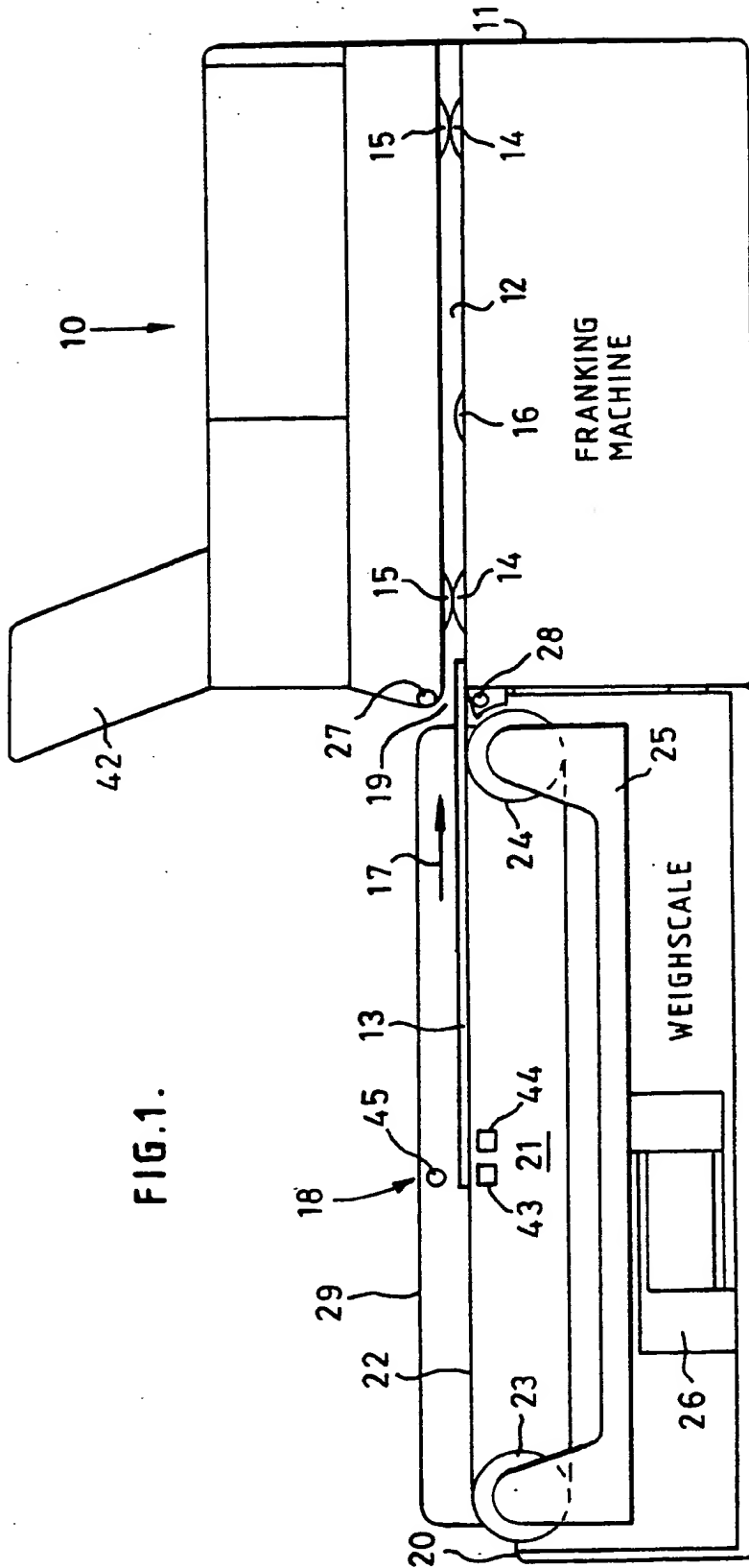
(54) **Postage meter with automatic feed of mailpieces from weighscale**

(57) A weighscale in combination with a franking machine is disclosed. The weighscale comprises a feed belt mounted on a cradle supported by a load cell. Mail items are placed manually on feed belt and sensing means ensures that the item is positioned in engagement with a rear guide so that the item is correctly positioned for feeding by the belt directly into the franking machine. Electronic circuits in the franking machine are connected to the operative elements of the weighscale to receive weight and sensing signals from the weighscale and to energise the feed belt drive when the franking meter has been set to print a postage value determined by weighing of the mail item. The connections between the weighscale and the franking machine permit the weighscale to be spaced from the franking machine for weighing of large items.



At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

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**FIG. 1.**

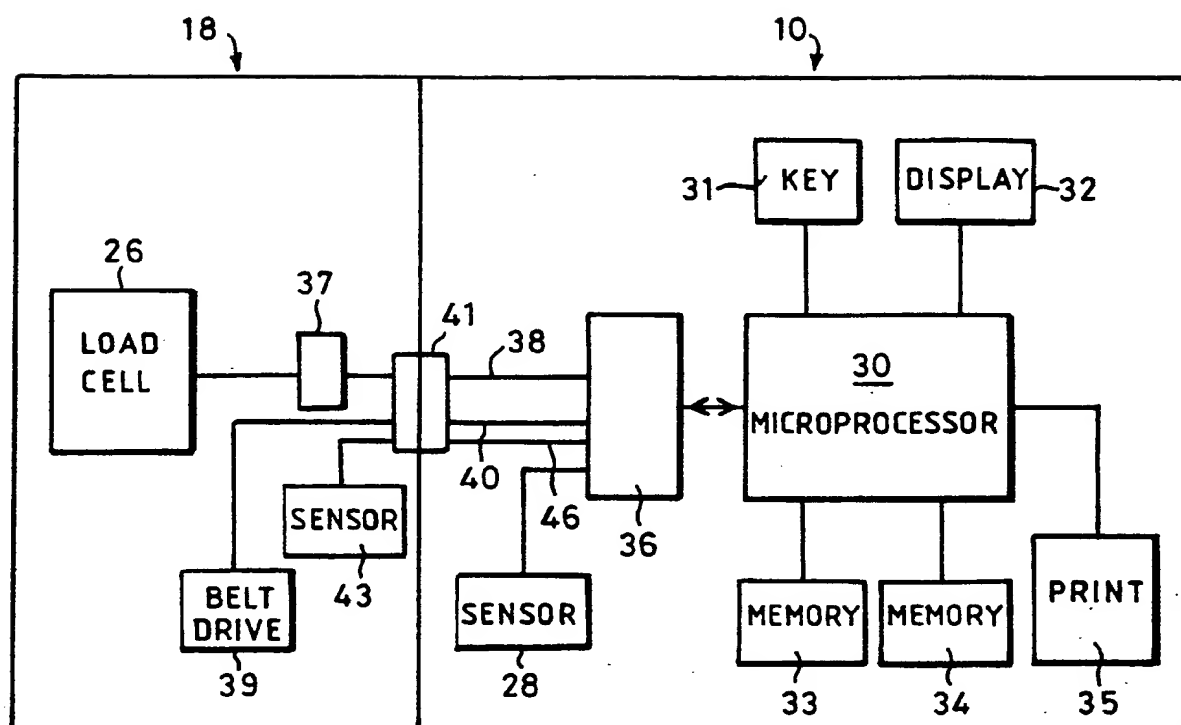


FIG.2.

WEIGHSCALE AND FRANKING MACHINE

This invention relates to franking machines and in particular to the combination of a weighscale with a franking machine to weigh items of mail prior to the items  
5 being franked by the franking machine.

Postal charges are usually related to the weight of mail items and hence prior to franking of a mail item it is necessary to determine the weight of the item in order to  
10 assess the value of the postal charge. In many offices handling relatively small quantities of mail, a weighing machine is provided adjacent the franking machine and a user places a mail item on the weighing machine, reads the weight of the item and then sets the franking machine to  
15 apply the appropriate value of franking and manually places the mail item at the input of the franking machine. In order to automate some of these steps, electronic weighing machines have been provided which are electrically coupled to the franking machine. When an  
20 item is placed to be weighed on the weighing machine, the machine responds to the weight of the item to calculate the required postal charge and, by means of the electrical connection between the weighing machine and the franking machine, inputs a signal to the franking machine  
25 representing the postal charge. This input sets the franking machine to print the required value as part of the franking impression.

However such arrangements of interconnected weighing  
30 machine and franking machine still require manual handling of the mail items to transfer them from the weighing machine to the franking machine.

According to the present invention a combined weighscale  
35 and franking machine includes a feed path for mail items to be franked; means for feeding mail items along the feedpath; a printing device located adjacent the feedpath

and operable to print a franking impression on mail items as they are fed along the feedpath past the printing device; a support aligned with said feedpath operative to support mail items for entry to said feedpath; weighing  
5 means responsive to the weight of an item on said support; and means operable to feed items from said support into said feed path.

Preferably the support comprises a feed belt and drive  
10 means to drive the belt to feed mail items to the feedpath.

An embodiment of the present invention will now be described by way of example with reference to the drawings  
15 in which

Figure 1 shows a side view of a combined weighscale and franking machine and

Figure 2 is a block circuit diagram of the weighscale and franking machine.

20

Referring first to Figure 1 of the drawings, a franking machine 10 comprises a housing 11 through which a feed path 12 for mail items 13 extends. Pairs of rollers, each comprising a driven feed roller 14 and a co-operating  
25 pressure roller 15, are located with the nips between the rollers of the pairs aligned with the feed path to receive mail items successively in the nip between the rollers and thereby to feed the mail items along the feed path. A print head, not shown, is located between the pairs of  
30 rollers 14, 15 and a print pressure roller 16 is provided opposite the print head to maintain mail items in printing engagement with the print head as the items pass the head. The driven rollers 14 are rotated in a clockwise direction, as seen in the drawing, so as to feed the mail  
35 items in the direction of arrow 17.

A weighscale 18 is located at the side of the franking

machine adjacent the entry 19 for mail items to the feed path 12. The weighscale 18 may be constructed integrally with the franking machine 10 but it is preferred to construct the weighscale 18 and franking machine 10 as  
5 separate modules which are detachably secured together. The weighscale comprises a housing 20 with a transport assembly 21 mounted therein. The transport assembly comprises a feed belt 22 extending around rollers 23, 24 supported on a chassis 25. The transport assembly 21 is  
10 supported in the housing by a load cell 26 secured to the housing. The load cell incorporates a differential amplifier in order to provide a noise immune, low impedance output for electrical signals from the load cell. The feed belt 22 has an upper run extending  
15 substantially horizontally in alignment with the feed path 12 of the franking machine module and forms an extension of the feed path on the inlet end thereof. An electric motor, not shown, is carried on the chassis and drives one of the rollers 23 or 24 such that the upper run of the  
20 feed belt is driven in the direction of the arrow 17 whereby mail items placed upon the feed belt are carried to the entry 19 to the feed path 12 and thence into the nip of the first pair of rollers 15, 16 to be fed past the print head to receive a franking impression. A guide 29  
25 secured to the chassis 25 extends parallel to the feed belt 22 to guide a rear edge of mail items fed by the belt 22 into alignment with a rear edge of the feed path of the franking machine.

30 For normal use of the weighscale, the weighscale is mechanically secured to the franking machine module and electrical connectors on the two modules engage with each other to provide electrical connections between the modules.

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When a mail item is placed on the feed belt, the transport assembly is deflected downwards and this deflection is

sensed by the load cell to generate an electrical signal representing the weight of the item and due to the driven feed belt the item is carried to the franking machine module without any additional manual handling of the item.

5 A sensor 43 is provided on the chassis 25 adjacent the guide 29 to detect when a mail item is present on the belt 22 with the rear edge of the mail item in engagement with the guide 29. The sensor 43 may receive light radiation emitted from an emitter 44 positioned adjacent thereto and  
10 reflected by a mail item or alternatively an emitter 45 may be located in the guide 29 adjacent the sensor 43 such that radiation received by the sensor from the emitter is interrupted by the presence of a mail item. The locations of the emitter 45 and sensor 43 may be interchanged if  
15 desired. The radiation is preferably in the infra-red band of the spectrum. An electrical signal from the sensor indicates to the microprocessor of the franking machine that a mail item is present on the weighscale and supported by the assembly 21 and furthermore that it is  
20 correctly aligned against the guide 29 for feeding to the feed path of the franking machine. When the sensor indicates the presence of a mail item, the mail item is wholly supported by the transport assembly 21 and hence the signal from the load cell indicates the weight of the  
25 item.

The electrical signal from the load cell is sensed by the microprocessor in the franking machine module when the sensor 43 indicates the presence of a mail item on the  
30 weighscale. After sensing the output from the load cell 26, the microprocessor calculates the value of postage charge appropriate to the weight of the item, causes the drive to the feed belt 22 to be energised to feed the item to the franking machine to receive the franking impression  
35 and controls the printing device to print the franking impression on the item as it is fed past the printing device.

A sensor is provided adjacent the entry 19 to the feed path 12 of the franking machine module. This sensor comprises a light emitter 27 such as a light emitting diode and a photosensitive device 28 responsive to light from the emitter 27. The light from the emitter is interrupted by the presence of a mail item at the entry to the feedpath of the franking machine. If, after a mail item has been weighed and franked, no further mail item is detected by the sensor 27, the energisation of the drive to feed belt is terminated.

Referring now to Figure 2, the franking machine module includes a microprocessor 30 for carrying out accounting and control functions in relation to usage of the franking machine for printing franking impressions on the mail items. A keyboard 31 is provided for entering data and command signals to the microprocessor and a display device 32 is provided to display data and information to a user of the machine. Non-volatile memories 33, 34 are provided for the storage of accounting data relating to usage of the franking machine, the accounting data will usually include a value of credit available for franking, an accumulated value of franking printed by the machine and a count of the number of items franked by the machine. The memory also stores data in the form of a table relating postage charge to weight of the mail item for one or more classes of mail service. The microprocessor 30 controls operation of a printing device 35, located in the franking machine module 10 adjacent the feed path as described in relation to Figure 1, to print franking impressions on mail items as they are fed along the feed path.

An input/output interface 36 is connected to the microprocessor and via this interface the microprocessor interrogates the state of the photosensitive device 28 of the mail sensing device. The load cell 26 is connected to



an analogue to digital converter 37 to input digital signals representing weight of a mail item via a connection 38 and the interface 36 to the microprocessor. The microprocessor is controlled by a programme routine to  
5 receive the digital signals representing weight in response to an electrical signal on a connection 46 indicating sensing of a mail item by the sensor 43. The motor drive 39 for the belt 22 is controlled by the microprocessor via the interface 36 and a connection 40.  
10 It will be appreciated that the connections 38, 40 and 46 extend from the franking machine module to the weighscale module and hence are routed via an electrical connector 41.

15 If desired the weighscale module may be arranged to be operated when mechanically separated from the franking machine module, but electrically connected thereto, in order to enable the weighing of parcels. The electrical connection would be by way of a connecting cable connected  
20 to the electrical connector parts carried by the weighscale and franking machine modules. The weighscale housing may be provided with a receptacle for storage of the cable when not in use. Alternatively the weighscale may be connected to the franking machine module by cable  
25 both when the two modules are mechanically interconnected and when separated. In this arrangement, when the modules are mechanically connected together, the cable may extend externally of the modules or may be retracted into the weighscale housing.

30 As described hereinbefore, when the mail items are envelopes, the feed belt carries the envelopes into the feed path and the photosensitive device detects the arrival of the leading edge of the envelope at the entry  
35 to the feed path. However, when the weighscale is detached from the franking machine for use in weighing a mail item comprising a parcel, the mail item will not be

fed into the feed path and hence the feed belt will not be driven and the photosensitive device will not be interrogated to detect presence of a mail item.

- 5 The keyboard is provided with keys for the entry of data and commands relating to use of the franking machine module and in addition is provided with additional keys relating to operation of the weighscale in conjunction with the franking machine. The additional keys when
- 10 operated will effect the following operations:-  
NULL key effects zeroing of the load cell which is required in order to compensate for drift of the load cell over a period of time.  
ON/OFF key to switch the weighscale into and out of
- 15 operation.  
MODE key to select letter or parcel mode. In the letter mode the microprocessor causes the feed belt to be driven and interrogates the photosensitive device. In the parcel mode the belt drive is turned off and the photosensitive
- 20 device is not interrogated.  
TRANSFER key commands the microprocessor to input weight data signals from the load cell when the weighscale is being used when detached from the franking machine for weighing parcels.
- 25 WEIGHT key causes the weight of the mail item item to be displayed by the display device.  
PRICE key causes the postal charge computed from the weight of the item and class of postal service selected.
- 30 One or more further keys are also provided to select different classes of mail service.

- When the mail item is an envelope, the mail item is fed along the feed path past the printing device and receives
- 35 the franking impression directly on its surface. However with larger items such as parcels which cannot be fed along the feed path, the franking machine is arranged to

print the franking impression on a label dispensed from a label dispenser 42.

When the weighscale is switched out of operation by the  
5 ON/OFF switch, the sensor 43 may remain operative to enable control of the operation of the drive to the feed belt by the microprocessor to assist in feeding mail items to the franking machine even though they are not weighed by the weighscale.

10

It will be appreciated that the construction of weighscale and franking machine either as an integral machine or as independent modules which are arranged so that they can be secured together provides a simple construction which can  
15 be manufactured for relatively low cost. Furthermore the combining of the electronic functions required for the weighscale with those required for the franking machine by carrying out these functions by means of the electronic hardware and software of the franking machine provides  
20 further economies in manufacturing costs.

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CLAIMS

1. A combined weighscale and franking machine including a feed path for mail items to be franked; means for feeding mail items along the feedpath; a printing device located  
5 adjacent the feedpath and operable to print a franking impression on mail items as they are fed along the feedpath past the printing device; a support aligned with said feedpath operative to support mail items for entry to said feedpath; weighing means responsive to the weight of  
10 an item on said support; and means operable to feed items from said support into said feed path.
2. A combined weighscale and franking machine as claimed in claim 1 wherein said support comprises a feed belt and  
15 drive means to drive the belt to feed mail items to the feedpath.
3. A combined weighscale and franking machine as claimed in claim 2 including sensing means responsive to the  
20 presence of a mail item on said support; and control means in said franking machine operative in response to said sensing means indicating presence of a mail item to receive an indication of weight of the mail item on said support from said weighing means and calculate a value of  
25 postal charge corresponding to that weight.
4. A combined weighscale and franking machine as claimed in any preceding claim wherein said weighscale and franking machine are constructed as separate modules and  
30 means are provided to mechanically and electrically interconnect said modules.
5. A combined weighscale and franking machine as claimed in claim 4 wherein the mechanical connection therebetween  
35 is releasable and the modules are interconnected by a cable.

6. A combined weighscale and franking machine as claimed in any preceding claim wherein said franking machine includes accounting and control means selectively operable to control operation of the weighscale.

5

7. A combined weighscale and franking machine as claimed in any preceding claim including a guide on said support to engage an edge of mail items thereon and effective to guide that edge into alignment with the feedpath.

10

8. A combined weighscale and franking machine including electronic and control and accounting means operable to carry out control and accounting functions in relation to the printing of franking impressions wherein said  
15 electronic means is responsive to sensing signals and weight indication signals in relation to the weighing of items on the weighscale and is operative to control feeding of said items from the support to the feedpath.

20 9. A combined weighscale and franking machine constructed and arranged to operate substantially as hereinbefore described with reference to Figure 1 or to Figure 1 and 2 of the drawings.

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